

Application No. 09/683,658  
Reply to Office Action of April 4, 2005

121655-1

### REMARKS

Applicant respectfully requests entry of this Amendment and reconsideration of the pending claims. Claims 1-93 stand rejected, claims 94-103 were restricted. This Amendment cancels claims 1-103, and adds new claims 94-146. Accordingly, claims 94-146 are currently pending in the application.

The disclosure was objected to based on an informality. Paragraph [0028] is amended as suggested in the Office Action.

Claims 1-93 are hereby cancelled. Some of the claims are rewritten as new claims as indicated below. The rejections are addressed for the new claims as they correspond to the cancelled claims.

The rejections under 35 USC § 112 are addressed by the cancellation and rewriting of the claims. Particularly, "self-pressurizing" has been removed. Antecedent bases have been corrected. "Pressure response" has been stated as a positive element. Claims directed to the capsule, per se, have been removed. Applicant submits that the rejections under 35 USC § 112 are addressed by this Amendment.

Claims 104 and 146 are the only independent claims, and are not directed to a capsule, per se. Thus, the rejections under 35 USC § 102 as being anticipated by Jacobs and Suthanthiran should no longer apply.

With regard to the rejections under 35 USC § 102 as being anticipated by Wilson or Vahldiek, Applicant submits that each of the apparatuses shown or disclosed differs from the invention as defined in claims 104 and 146. Particularly, the presses in the cited references supply the pressure to the object being worked on, and it is not the object that creates the pressure. For example, the tapered punches 28 and 29 of Vahldiek "deliver the force of their thrust against the steel disk 17 and at the opposite ends of the cell in FIG. 1." (Column 2, lines 31-32). In Wilson, "two press pistons 23 and 24 having tungsten carbide end elements 26 and 27 configured to cooperate with counterbores 18 and 19 and bore 17 *in order to impose pressure on the sample contained within the bore*

Application No. 09/683,658  
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121655-1

17.” (Emphasis added) (Column 3, lines 15-19).

In both of claims 104 and 146, the restraint is substantially passive, and for the most part the pressure the restraint supplies is merely to resist the outward force generated by the heating of the sealed capsule. The resultant passive force differs in several ways from the force supplied by an active press. For example, in one instance the presses in the cited art must be active through the entire process, whereas a passive restraint simply resists by virtue of its configuration and composition – no energy needs to be expended. In another instance, the control of the pressure can be performed using a heat control system, as opposed to the cited references that need mechanically control the press. Neither the structure nor the function of the claimed invention is disclosed in the cited references. Applicant submits that the rewritten claims 104 and 146 are allowable over the cited references.

With regard to the rejections under 35 USC § 103, for at least the reasons given above Vahldiek does not show the invention as defined in claim 104. Because none of the other references show all the elements of the claimed invention, the combination of Vahldiek with any or all of the other references, would not show the invention as defined in claim 104. Some of the new dependant claims are called out and discussed individually, below. But, as they depend from allowable claim 1, they are also allowable.

Claim 111 is rewritten from claim 7, and is directed to differentially heating portions within the capsule. The Office Action contends that would obvious where the general conditions are disclosed in the prior art and the discovery of optimum or workable ranges involves only routing skill in the art. (Page 13, para. 2). However, without a motivation to modify the prior art to achieve the claimed invention, a *prima facie* case of obviousness has not been made. No motivation is provided in the references, or has been identified in the Office Action. As such, Applicant submits that a rejection under 35 USC § 103 would be improper, and requests that the rejection be withdrawn.

For new claim 115, the Office Action does not suggest, and neither do the

Application No. 09/683,658  
Reply to Office Action of April 4, 2005

121655-1

references, a carbon-based material such as is defined in the claim. For a proper *prima facie* case of obviousness, there must be a reasonable expectation of success by one of ordinary skill in the art. Here, it would not be obvious to one of ordinary skill, nor would it be reasonable to expect, that materials listed in claim 115 would be suitable for such high pressure and high temperatures as would be encountered during use of the claimed invention.

For claims 130 and 131, "the restraint is operable to transmit pressure to the capsule such that the transmitted pressure to the capsule is measurable as a pressure response of less than about 0.2" or 0.05 as the case may be. A significant aspect here is that the devices shown in, for example, Vahldiek require that the pressure from the press be transmitted to the subject material. Thus, the pressure transmission efficiency, or pressure response, should be as high as possible – 100% if there were no friction. For all of the pressure vessels shown in the cited references, a reduction of pressure response to near zero would be entirely unsuitable, and would at the very least be opposite the desired result of the disclosed art.

Claim 136 refers to "the capsule, when sealed, is impermeable to hydrogen." Applicant submits that none of the cited art references disclose the same, nor is there any reason why they should. Hydrogen permeability should not affect the use or performance of the disclosed apparatuses in the prior art. There is no motivation to modify the prior art capsules or cells to have such a feature.

With reference to new claim 140, a press is included. However, the press is for applying a pre-load pressure only. The press is not used to supply the operating pressure. This is different from the disclosed apparatuses in the prior art, which are required to supply the working pressure to the capsule or cell and would not function for their intended purpose if they provided a pre-load pressure only. Claim 141 is allowable for at least the same reasons that claim 140 is allowable.

Claims 144 and 145 are directed to a capsule that can withstand a pressure of greater than about 5 kBar, or greater than about 60 kBar, respectively. Pressure limits for

Application No. 09/683,658  
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121655-1

capsules or cells are disclosed in several of the references, in Vahldiek the pressure is 50 kBars at 1700 degrees Celsius, and in Wilson the capsule pressure goes up to 60 kBars (col. 2, l. 58, and col. 3, l. 44, respectively). For at least claim 145, none of the references disclose or suggest a pressure capability approaching the instant capability.

Claim 146 incorporates many of the features found in other claims, but has a different claim scope. Claim 146 is allowable for at least the reasons listed above for such corresponding claims.

Applicant submits that the rewritten claims 104-146 are allowable over the cited art, and respectfully requests that a notice to that effect be issued. Should the Examiner believe that anything further is needed to place the application in condition for allowance, the Examiner is invited to contact the Applicant's undersigned representative at the telephone number below. Any additional fees for the accompanying response are hereby petitioned for, and the Director is authorized to charge such fees as may be required to Deposit Account 07-0868.

Respectfully submitted,



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